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The BULLETINS will not appear during the holidays. Next issue will be January 6, 1947.

B. ANTHONY STEWART

TRANSLUCENT STAINED-GLASS SAINTS SMILE DOWN ON WASHINGTON CATHEDRAL CHOIRBOYS

For Washington, D. C., holiday observers, the lilt of a familiar Christmas carol adds to the spiritual light of one of the Gothic-style church's brightly colored windows (page 5).

Byrd Again Leads Expedition to Antarctica

REAR ADMIRAL RICHARD E. BYRD, veteran polar explorer, is again on his way to Antarctica, but this time he and his men may not be alone with the penguins. A group from Great Britain is believed to be already established on the frigid continent, another American expedition is in planning, and Russia, Norway, and Chile are sending men.

Under Byrd's direction is a United States Navy detachment of 4,000 men and a dozen ships—one of them an aircraft carrier. This expedition and the other groups plan to be on Antarctica during the brief polar "summer" of January and February, 1947.

Coal Deposits Found Near South Pole

Recent speculation has planted great deposits of uranium under the perpetual ice, but more than guesswork is the belief among scientists that Antarctica holds mineral resources valuable to man.

Admiral Byrd on a previous trip discovered within 1,500 miles of the South Pole enough coal to supply the United States for 30 or 40 years. Sir Ernest Shackleton, British explorer, found brown coal 400 miles from the Pole. Chunks of petrified wood were brought back by Lincoln Ellsworth, another American polar pioneer.

To scientists who read the earth's history in such clews, these signs indicate that 100 million years ago Antarctica had a climate favoring lush vegetation—the geologic forerunner to coal, petroleum, diamonds, and possibly other minerals. A mere 30,000 years ago, North America was covered, as Antarctica now is, with a thick icecap.

Amundsen, who first reached the South Pole, and the unfortunate Scott, as well as Shackleton, Byrd, Ellsworth, and other 20th century explorers, have viewed nearly 2,000,000 of Antarctica's estimated 5,250,000 square miles. They have mapped the South Pole itself and virtually the full 14,000-mile perimeter of the frozen land mass.

Ross Sea and Weddell Sea Take Bites of the Continent

Explorers have found it cruel and rugged, colder than the Arctic, and swept by pounding gales and blinding snowstorms. Antarctica as a whole is higher above the sea than any other continent, probably averaging 6,000 feet in altitude. Many of the charted peaks tower higher than Mt. McKinley, the highest mountain in the United States. The plateau at the South Pole is 8,500 feet above sea level.

Roughly, the land mass is contained within the Antarctic Circle. The Ross Sea, south from New Zealand, and the Weddell Sea, south from Brazil, take big bites out of the continent. In either sea, ships in summer may approach within 700 miles of the South Pole. Only across the shelf ice massed in the southern part of the Ross Sea has the South Pole so far been attained. On, and in, this ice, is Little America (illustration, page 2), base of Admiral Byrd's former Antarctic expeditions.

The western shore of the Weddell Sea is formed by the Palmer Peninsula, on which Antarctica reaches farthest north. The peninsula's tip

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BYRD ANTARCTIC EXPEDITION

UNDER LITTLE AMERICA'S PERPETUAL SNOW, MEN OF ADMIRAL BYRD'S SECOND ANTARCTIC TRIP BUSILY STUDY AND RECORD SCIENTIFIC DATA

The globe on the table encloses an instrument for cosmic ray observation. At the bench (right) men examine plankton, microscopic ocean life, taken from the Bay of Whales, near whose icy shores stood the base for Byrd's Antarctic visits of 1929 and 1934 (page 3).

Stained-Glass Windows Lift Men's Hearts

WHAT a Christmas carol is to the ear a stained-glass church window is to the eye. Men's hearts since the Middle Ages have been lifted by religious subjects in translucent colored glass. The smiles of saints, carried down by slanting sunbeams, have given many a worshipper the sense of personal contact with heaven.

But the making of stained glass, considered for centuries solely an ecclesiastical art, actually started as a secular enterprise, and in recent years has again branched out into non-religious subjects and fields. In the national capital's Episcopal cathedral (illustration, cover), the Statesman's Window, recently dedicated, features James Madison and Thomas Jefferson.

American Stained-Glass Industry in Postwar Boom

More and more the craftsmen who design and execute themes in stained glass are being commissioned to do subjects taken from legend, romance, science, and modern history. Tom Sawyer and Sir Galahad appear in windows in the playroom of a Cincinnati hospital. Euclid and Charles Darwin are important figures in chapel windows at Colorado College.

Dedications of windows, in this and other countries, indicate the postwar revival of the stained-glass industry. America's artists report a growing backlog of commissions. Community plans for war memorials include theme windows for new churches, libraries, and community centers, and for new wings of edifices already built.

A new window in St. Andrew's Church in Northamptonshire, England, was contributed by American servicemen stationed near by during World War II. Its panels of American history range from the Pilgrim Fathers to the Atlantic Charter meeting of Winston Churchill and Franklin D. Roosevelt.

In France, Germany, Italy, and England are scores of cathedrals whose stories in glass were shattered by bombs during World War II. In some instances, efforts are being made to duplicate their original form, color, and translucence.

Byzantine and Venetian Artists Developed the Art

Other exquisite Old World windows, as at Canterbury Cathedral and Windsor Castle in England, were removed and stored in 1939, but suffered unexpected damage from microscopic plant life in their storage vaults. These can be restored under expert direction.

Byzantine and Venetian artists of the 10th century and earlier pioneered glass making, and developed the idea that mosaics of glass could be translucent as well as opaque. European monks, skilled by long practice as manuscript illuminators, seized on the high spiritual appeal of the idea and made it a contribution to religious art.

Windows in the cathedrals at Le Mans, Poitiers, and Chartres in France are probably the oldest produced by the skill of these monks, who learned to color their glass in its molten state. Their art flourished through the 14th and 15th centuries, then declined for various reasons.

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lies within 500 miles of South America's Cape Horn. Its mountains are a continuation of the Andes Range of South America.

Palmer Peninsula's west coast was well known to sealing fleets long before men became familiar with the massive continent to which it is attached. Westward, between it and the Ross Shelf Ice, lie James W. Ellsworth Land, claimed for the United States by Lincoln Ellsworth in 1935, and Marie Byrd Land, claimed for the United States by Rear Admiral Richard E. Byrd in 1929.

Admiral Byrd (illustration, below) flew to the North Pole in 1926 and to the South Pole in 1929. For the 1926 feat he received from President Coolidge the Hubbard Gold Medal of the National Geographic Society. After the latter achievement, financed in part by the Society, President Hoover presented him with the Society's Special Medal of Honor.

Explorers from no less than nine nations have claimed parts of the vast frozen area. Nations besides the United States and Great Britain whose citizens have claimed areas are Norway, Japan, Australia, France, Belgium, Germany, and Russia. Chile, Argentina, and New Zealand, the countries nearest Antarctica, are also definitely interested.

NOTE: Antarctica is shown on the National Geographic Society's Map of the Northern and Southern Hemispheres. A price list of maps may be obtained from the Society's headquarters, Washington 6, D. C.

See also, "My Four Antarctic Expeditions" (Ellsworth), in the *National Geographic Magazine* for July, 1939; "Exploring the Ice Age in Antarctica," October, 1935*; "National Geographic Society Honors Byrd Antarctic Expedition," July, 1935; "Antarctica's Most Interesting Citizen," February, 1932*; and "Conquest of Antarctica by Air," August, 1930*. (*Issues marked by an asterisk are included on a special list of Magazines available to teachers in packets of ten for $1.00.*)

BYRD ANTARCTIC EXPEDITION

ADMIRAL BYRD, AT LITTLE AMERICA IN 1934, TAKES TIME TO ROMP WITH THE HUSKIES

Hawaii, Where Mountains and Flowers Flame

FLAMING fountains of lava, watched in perfect safety by visitors to Hawaii National Park, are flung high in the air from some of the world's largest volcanoes. Tropical flowers blaze amid the lava flows and in sections of the park unscarred by volcanic action. Forests range from coast palm groves and dripping jungles to stunted, wind-twisted ohia trees high on Mauna Loa.

Situated in the Pacific 2,000 miles southwest from the nearest point of mainland United States, Hawaii's park is the only tropical area in the national system. It is unusual also for its two widely separated sections. The larger portion is on Hawaii, the name island of the group. The smaller area includes the great extinct crater, Haleakala, on Maui. Both islands are reached from Honolulu, on Oahu, by steamer and plane.

From Tropic Strand to Snow-spotted Peak

On Hawaii, the park climbs from the south coast up the jungle-grown slopes of Kilauea and Mauna Loa, with their still-active firepits and fantastic lava formations, to Mauna Loa's snow-rimmed summit crater, Mokuaweoweo, 13,680 feet above the Pacific.

Steamy jungles blanket mountain slopes above wind-cooled beaches. Higher, dense forests of koa, kukui, ohia, and rare sandalwood temper tropic heat. At the level of Kilauea crater (4,090 feet) asters, marigolds, and zinnias flourish in temperate-zone sturdiness. Visitors don sweaters, and if they are hardy enough to make the 30-mile foot or horseback ascent to Mokuaweoweo, they will more often than not find snow.

From Hilo, on Hawaii's northeast coast, a highway ascends nearly 5,000 feet in 30 miles to park headquarters at Kilauea. Gigantic tree ferns stretch feathery fronds across the road to form a cool green tunnel. White ginger blossoms, wild roses, and vivid fuchsias paint splashes of color among the gray-green sickle leaves of the kukui.

Kilauea is the liveliest as well as the largest of all active volcanoes. It appears to be a crater on the slope of the larger, higher mountain, Mauna Loa. In reality, it is a volcano in its own right, but centuries of lava flows have filled in the valley between so that the two mountains seem merged.

Kilauea's Fireworks Attract Crowds

Kilauea's oval crater is about five miles across. Walls 500 feet high in places rim its lava-carpeted floor. A trail down the cliff crosses the crater through patches of jagged, clinkery *aa* (ah ah) lava, and twisted masses of the *pahoehoe* variety—shining and smooth like taffy. It ends at the edge of Halemaumau, Kilauea's circular firepit, about 3,000 feet in diameter. At times this pit is 1,500 feet deep, and again, boiling lava fills it to overflowing.

Occasionally Pele, goddess of the firepit, puts on a spectacular show, rocketing pumice, rocks, and flaming lava. At other times Halemaumau lies so quiet and tame that a visitor can safely sit down at the end of the trail and hang his legs over the brink. In Hawaii people run to, not from eruptions. When Kilauea turns on her fireworks people from miles

During the past eight decades, stained-glass craftsmanship has regained its lost ground by rediscovering the painstaking methods of five centuries ago. American craftsmen (illustration, below) have risen to create work as distinguished as the best produced by Old World artists.

Glass is now made by one West Virginia plant in some 450 shades. Colored by adding metallic oxide pigments to the molten mass, it is then blown into cylinder shapes. The closed ends of the glass cylinder are snipped off with hot wire; the cylinders are cut down the side, reheated, and flattened into sheets.

The sheets are cut to the sizes and shapes indicated on the artist's "cartoon," an actual-size drawing of the window design which shows the web of lead channels holding the pieces of glass. Color shades are chosen to match the artist's small-scale drawing in full color.

For additional information, see "Glass 'Goes to Town'" and "From Sand to Seer and Servant of Man" (22 color photographs), in the *National Geographic Magazine* for January, 1943*.

CLIFTON ADAMS

PHILADELPHIA ARTISTS WEAVE A MAGIC SPELL WITH STAINED GLASS

At left stands a "cartoon," full-size design of a projected window. Pieces of glass, cut to follow the lines of the drawing and colored to specifications, are then fitted together like a jigsaw puzzle into a webbed pattern of grooved lead strips. The color is obtained in the first place by adding oxides of various metals to molten glass. Copper imparts a deep green or blue; iron, pale yellow or green; manganese, pink or violet; cobalt, a rich blue; tin, white, and so on.

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Barbados Adds Cabinet to Ancient Assembly

ESTABLISHMENT of a governor's cabinet in Barbados calls attention to the fact that this West Indies island has one of the oldest parliaments in the British Empire. It celebrated the tercentenary of its assembly in 1929. The only older overseas legislative bodies in the empire are those of Bermuda and the Bahamas.

When the officers and crew of a British ship landed in 1605, they claimed the island for their king, James I. The first English settlers arrived in 1626, twenty years after the founding of Jamestown, Virginia. Barbados is the only West Indies island which has flown but one flag.

Resemblance to Mother Country Gives Name "Little England"

Barbados is the easternmost of the Lesser Antilles—the crescent of islands that separates the Caribbean Sea from the Atlantic Ocean. Its western shores are washed by the Caribbean. Its rocky east coast is cooled by trade winds blowing over the Atlantic. Although less than 14 degrees north of the Equator, these prevailing winds moderate the climate to a temperature range of from 70 to 86 degrees Fahrenheit.

Unlike many of the West Indies islands, Barbados is largely low, rolling country. Its highest point is 1,100-foot Mount Hillaby. No part of the island is more than five miles from the sea. It is almost completely ringed by coral reefs. Coral rock furnished the material for most of the public buildings. Their modified Italian renaissance architecture is as reminiscent of England as is the level green countryside.

Because English customs, architecture, and characteristics were brought to the island, Barbados acquired the name "Little England." But its immigrants, even in the early days, were not all English. It became a land of exile for Irish and Scots who were considered troublesome at home. The Scots were attracted to the island's northeast region by its resemblance to the highlands of their native land. Their descendants have held themselves aloof from the other islanders. They live in a region called the Scotland District, where many of them eke out a slim living by making pottery from the local clay.

Barbados Can Say "Washington Slept Here"

Barbados has two outstanding commodities. One is sugar from plantations which cover half the island. The sugar cane is handled by thousands of Negroes (illustration, page 10) who make up the bulk of the dense population of 193,000.

The other commodity is non-exportable—a healthful, even climate. Barbados was renowned for this long before George Washington took his invalid half-brother, Lawrence, there nearly two centuries ago. It was George Washington's only visit to a foreign land.

The island was originally covered with trees—locust, cedar, fustic, and others; but the forests did not long survive the arrival of white settlers. Now timber and shingles must be imported. Fish—notably the flying fish—is the staple article of diet. Local agriculture consists largely of raising vegetables, with sweet potatoes most plentiful. Some cattle are raised, and a type of woolless sheep supplies mutton.

around rush to the show. Planes and steamers are booked to capacity.

When the volcanoes sleep the park is still a fascinating playground. In the bird sanctuary—Kipuka Pualu, left islandlike among old lava flows, grow about 40 species of trees. Through their branches flutter rare birds, including the scarlet iiwi, the omao, and the yellow amakihi.

The Kilauea area has a hotel, a camp run by the government for the armed forces and their families, and two automobile camps.

Mauna Loa's summit crater, Mokuaweoweo, towers nearly a thousand feet above Kilauea. It discharges more lava than any other volcano, in eruptions that occur about every seven years. Scientists usually predict an outbreak in time for people in the vicinity to seek safer ground. Mauna Loa has never killed anyone.

Dominating west Maui, Haleakala is the largest dormant crater in the world (illustration, below). Fantastic cinder cones rising hundreds of feet from the crater floor preserve flaming colors of volcanic fires which once blazed from its 3,000-foot depths.

NOTE: The Hawaii National Park is shown on a large-scale inset on the Society's Map of the Pacific Ocean.

See also "Hawaii, Then and Now," in the *National Geographic Magazine* for October, 1938*; and "The Hawaiian Islands," February, 1924.

NEWS OF HAWAII

A CAVALCADE OF VISITORS TRAVERSES HALEAKALA'S RUGGED FLOOR

Only a horse—or his own feet—can safely transport the visitor across the wonderland of this 19-square-mile crater floor where, among the ancient cinders, grow such rare plants as the purple-blossomed silver sword. In occasional breaks in the walls, green meadows, where springs seep through volcanic soil, provide good campgrounds. There are shelter areas inside the crater.

Centennial Finds Iowa First in Food Output

IOWA, which on December 28 observes its 100th anniversary, produces more food for the tables of the nation than does any other state. The Hawkeye State has often been called the nation's breadbasket.

Across its rolling plains lies one-fourth of the Grade A soil in the entire country. That soil, once carpeted from the Mississippi on the east to the Missouri on the west with waist-high prairie grass, now grows grain crops in unmatched quantities.

Iowa is first in corn, oats, hogs (illustration, page 12), poultry, eggs, value of livestock, and in finished cattle for market.

Every Mile, a Road in Four Directions

The state is roughly rectangular, a pattern repeated over and over in its 222,000 farms and countless fields—nearly all of which are square or oblong. The flat checkerboard impression of today's traveler in Iowa is quite different from the concept of the first white visitor. Père Marquette, as he drifted down the Mississippi under the bluffs near present-day McGregor, in 1673, wrote in his journal, "To the right is a chain of very high mountains."

With rare exceptions roads run directly east and west or north and south, and there is one to every mile. Only seven states have more hard-surfaced highways than Iowa. The state is fourth in railroad mileage; no point is more than a dozen miles from a rail line. This transportation network gets precious crops to market in record time.

Every county seat is a market town of some importance, though much Iowa farm produce is destined for Chicago and other large out-of-state markets. Sioux City, on the western border, is, however, a stockyard and meat-producing center of nationwide importance.

Des Moines Was Not First Capital

Manufacturing, much of it directly related to agriculture, gives Iowa an industrial income nearly equal to that derived from its farms. Meat-packing and food-processing plants, canneries, tractor factories, and other farm implement plants reflect the state's agricultural character. But Iowa also has one of the largest fountain-pen factories, washing-machine factories, and button-making industries in the country.

Des Moines, the capital and largest city, is a nationally important insurance center. It was not made the capital until 12 years after Iowa became a state. Iowa City, site of the University of Iowa, was the first state government seat. The Des Moines area was opened up 101 years ago with a land rush of white settlers into recently evacuated Indian lands. Fort Des Moines lent its name to the new settlement.

The State Fair at Des Moines and the Dairy Cattle Congress at Waterloo differ only in size from the dozens of local fairs held annually over the state. Fair or no fair, farmers crowd into town to hear the Saturday night band concert and to transact their business on the courthouse square. Among the larger of the market and manufacturing cities are

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Sugar cane was once pressed by wind power, and the island's 166 square miles bristled with 400 stone-towered windmills. With the development of steam power, these gave way to the tall stacks of modern mills.

The descendants of the white settlers form about one-fifteenth of the population, living mostly in the suburbs of Bridgetown, the capital.

One theory regarding the origin of the island's name is that the Portuguese, who are known to have visited there long before its English settlement, named it after a banyan tree whose growth resembled a man's beard. The Portuguese word for beard is *barbudos*.

NOTE: Barbados is shown on the Society's Map of Mexico, Central America, and the West Indies.

For additional information, see "British West Indian Interlude" and "West Indies Links in a Defense Chain" (21 color photographs), in the *National Geographic Magazine* for January, 1941*.

EDWIN L. WISHERD

POURING TEA FOR A BARBADOS STEVEDORE, THE VENDOR GIVES A FREE BALANCING ACT

The drink is made by boiling the bark of the maubey tree and is a favorite along the waterfront of the British West Indies island. The girl exhibits uncanny skill in carrying the bulky container on her head, and especially in turning the spigot on and off without a drop of tea missing the cup.

Cedar Rapids, Ottumwa, Mason City, Fort Dodge, Council Bluffs, Marshalltown, Dubuque, Clinton, Davenport, Muscatine, and Burlington.

The state has more than 2,500,000 residents, who take pride in the fact that Iowa has the nation's lowest percentage of illiteracy. Thousands of white-painted, one-room rural schoolhouses and an ever-increasing number of modern consolidated schools make the educational system function in the country as well as in the urban areas.

NOTE: Iowa is shown on the Society's Map of the United States.

For additional information, see "Iowa, Abiding Place of Plenty" and "Corn and Color in the Hawkeye State" (20 color photographs), in the *Magazine* for August, 1939*.

J. BAYLOR ROBERTS

A FOUR-LEGGED FACTORY IN IOWA TURNS CORN INTO PORK, HAM, AND BACON

Another product is little pigs! A match for Blue Boy of "State Fair," this 1,300-pound behemoth grew up in Sac County, the popcorn center of the United States. Rockwell City, in adjoining Calhoun County, calls itself "the golden buckle of the corn belt."

BIBLE LANDS MAP HAS BEEN ENLARGED

The Map of Bible Lands and the Cradle of Western Civilization, a supplement to the December issue of the *National Geographic Magazine*, has been enlarged to 64½ by 44½ inches.

The supplement, with nearly 11,000 place names and 250 historical notes, while satisfactory for home reference, was, according to school officials and teachers, too compact for use in large classrooms. The demand for this enlargement has now been met. The maps are obtainable only from the headquarters of the National Geographic Society, Washington 6, D. C., at $2.00 each.